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The High School

Ninth and Tenth Grades

Latin: (ALLEN W. GOULD.) The pupils began with the study of the Roman school, because that topic seemed to connect itself most naturally with their own school life, and so would help to make the subject real to them. Their own experience would enable them to assimilate the Roman schools and studies. Pictures of Roman books and writing material were used to give distinctness to their ideas, and photographs of the streets and colonnades of Pompeii shown to give a local habitation to the Roman children as they came and went with their slave attendants.

The clothing followed next as a necessary detail to make the picture more complete in the mind of the child, and the evolution of clothing with the kinship of Roman toga and Indian blanket, served to give more unity to the growing idea. Pictures of statuary and vase-paintings helped to show how the garments were shaped and folded and fastened. We were fortunate this year in having at our Thanksgiving Festival a procession in costume which admirably illustrated the Roman robes, and intensified the interest of the pupils.

As each topic becomes clear to the child, he is encouraged to express it in Latin by using the idea rather than the mere words, and so the Latin sentences are to be made as answers to questions rather than as a translation of so much English into Latin.

Immediately following the study of schools and clothing come two lessons (VII and VIII), printed by mistake in the December issue. They both contain stories of school-children, and so connect themselves naturally with the interest already aroused, and carry it further by introducing two of the great Roman ideals, justice and honor. One story is that about the Faliscan school-children and Camillus, who will not do an unjust deed even to secure the capture of a hostile city. The other story is about Virginia, whose father slays his own daughter rather than see her dishonored.

Another reason for selecting this last story was the mention of the Decemviri. The pupils have already seen that the Roman boys learned the Twelve Tables of laws at their schools, as our children learn the Ten Commandments, and their attention can again be called to the profound reverence for law which the Romans had, and which made them the first great missionaries of law and order in this world.

In Lesson IX the lines from Vergil are to be memorized, one sentence after another, to help the pronunciation of the pupils and store their minds with a beautiful picture as well as accustom their ears to the rhythm of Vergil's hexameter. They are also asked to find out who Vergil was.

The second passage in IX has the ideal Roman matron once more, as a home-keeper and wool-worker, whom they have already met in their study of the way the Roman clothing was made, and will meet again in reading of Lucretia. Scipio's sarcophagus connects the Roman tombs with our own, and gives the pupil a bit of early Latin in its original shape, as a living language actually carved on the stone to describe a brave man, and so helps to make the Roman more real.

With Lesson X we take up another great debt which the world owes to Rome. The Romans were the first to build permanent and passable roads, and so bring men near to one another and spread the material and spiritual gains of every people over the whole world. The roads were the material means by which Rome set up her kingdom of law and order. The story of Lucretia connects itself with the preceding by the model matron which the students will easily guess. Then they will be asked to find Ardea and Collatia and their distance and direction from Rome; and then the question as to how the young man could ride so far in so short a time brings up the subject of roads. A consideration of the condition of our own country before the building of roads will help them to connect the primitive condition of Italy with America and all the world, and so unify their experience. The origin and meaning of the measures of "foot" and "mile" will naturally be asked, and so connect the Roman life still more with all life.

The idea of roads for riding on horseback leads naturally to carriage roads, and Lesson XI gives the picturesque story of the arrival at the Janiculum of Tarquinius Priscus and his wife. The omen of the eagle touches on religion, while the removal of the hat brings in Roman headgear, and the relatively late evolution of a hat and the function of human hair. The genesis of the wagon will be touched on and the students asked to draw the most primitive vehicle they can find described or have seen used. The pupils also locate the Janiculum and Tarquinii.

Lessons VII, VIII, X and XI are simplified from Livy, with an attempt to keep something of his style, and yet have only a few new words and forms in each story, and only such construction as the pupil may be expected to master.

The pupils had been asked to make their own dictionaries and grammars from the first, but it was found that some of them were seriously handicapped by their slowness in copying, and their difficulty in catching the sounds of the language by ear. Consequently we have made the experiment of introducing Collar and Daniell's *First Latin Book*, beginning about the middle of November.

Cæsar: (NINTH GRADE.) We found in the Ninth Grade a large number of students who had been studying Latin for one or more years in text-books based wholly on Cæsar's Gallic War. But as these students were nearly all of them unacquainted with Roman history it seemed unwise to plunge them at once into the battles of Gaul. They would have no idea of the meaning of this great struggle. They must be made to see that Rome had been trying for centuries to establish law and order in the place of battle and barbarism. Consequently these students have spent three months reading in the "Viri Romæ" the story of the Decemviri and Virginia, the capture of Rome by the Gauls, and the later battles with that race; the lives of Tiberius and Caius Gracchus with their attempts to give better law and order to the provincials; the life of Marius, with the terrible struggle once more against the barbarism of Gaul and Germany; the lives of Pompey and Lucullus, and of Cæsar down to his departure for Gaul.

Each student has also been asked to do some special reading for the class, one being responsible for Plutarch's *Marius*, another for his *Pompey*, and another for his *Sertorius*, and another for his *Cæsar*, while others have been asked to report on chapters 1-5 in Beesley's *The Gracchi, Marius and Sulla*, and chapters 1-4 in Merivale's *Triumvirates*. By the study of the physical wall-maps they have seen that the Alps and the Apennines are the two great barriers which have not always kept back the flood of vast and vigorous barbarians of Northern Europe.

As the students begin their Cæsar in January, they will be asked to make a fuller map of the scene of the Gallic wars, especially showing how the mountain ranges and the plains condition the course of the history and how the level lowlands of Germany could send their hordes of people southward and westward, and so from time to time force the flood of barbarians over the mountain barriers. Into this physical frame-work the students will be asked to fit the Gallic and Germanic ancestors of modern Europe, as described by Cæsar (Bks. I, 1, and VI, 11-24), and with such other information regarding them as the students can assimilate from Kitchin's *History of France* (Bk. I, 1-3), Duruy's *History of the Romans* (ch. 53-54), Harper's Classical Dictionary under *Gallia* and *Germania*, and the encyclopedias under *France* and *Germany*. They will be asked to compare the character and customs of these barbarians with the French and Germans they know about, to see their likeness and unlikeness, and to find out what has caused the change. They will also be helped to compare this roving and warring life with the law and order of the Romans, defective as it is, and they will be asked which of the two is more conducive to the world's welfare.

Then the students will read in Cæsar (Bk. I, 2-5) the story of the attempt of one of the roving, fighting races to leave their narrow boundaries; and they will be asked to find from their maps how the invaders can get out of Helvetia into the country to the south and west, and what measures Rome can and ought to take under the circumstances. Shall she allow the outposts of law and order to be driven in by the barbarians, or shall she extend those outposts still farther, so as to include still more of these gifted races in her great school? When they have given their own answer to this question, they go on in February to read Cæsar and find what answer he gave.

Greek: TENTH GRADE. Greek was begun this year without any text-book, the students being required to prepare their own lexicons and grammars as they needed them, and they made very rapid and satisfactory progress. But as the words and forms increased in number and complexity, it seemed fairer, for a part of the class at least, to have some book that should give them the required material without plunging them into the details of a grammar like Goodwin's or Hadley-Allen's. Consequently, Gleason and Atherton's *First Greek Book* was introduced about the middle of November. The first eight or ten chapters of this book were review to the class and were passed over rapidly. Then we took one chapter at each lesson, and had the students also read as much of our own printed lessons as they found time to prepare.

As pupils show great differences in their ability to read Greek and Latin, we have found it better to ask each one to work a certain time rather than assign the same amount of text for all. In this way the quickest pupil can have enough to do, and can help the slower by translating in the class what he or she has read. We have found it better, also, to divide the references so that different pupils shall have different subjects to study and report to the class. Even the dullest can thus have something of interest to impart to the others.

The reasons for choosing these conversations of Socrates were given last month when the lessons were printed. We wished the pupils to be put in contact with the mighty influence which Socrates came to have on all human life by his searching examinations of the most common topics, filial duty, law, education, brotherly love, and the dignity and duty of labor. How far it will be best to go in pointing out the principles of progress which Socrates revealed, we do not know until we see how far the pupils can receive these ideas. Perhaps we shall find it better to postpone the discussion of them till we reach the trial and death of Socrates, in the third year of the Greek course.

In connection with these lessons on Socrates, it was planned to have the students learn something of the historic background of Athenian life by reading week by week a brief account of the Persian wars, as found in the easy Greek of Moss's *First Greek Reader.* We shall try the plan of having each student responsible for a different part of the story, though all the class will be expected to follow his translation, so that they will all master the whole story. They will also be expected to follow the story with maps of the places and plans of the battles.

In addition to the references given in the December issue, we shall ask the student to follow the story of the Persian wars in some one of the larger histories of Greece, like Grote's, Curtius', or Duruy's, holding each student responsible for only one of these books. In this way we hope to help the students to acquire the habit of going to the best books for information, and also of watching the reports of the other students to see if there is anything for him to supplement or modify. This method, as applied in some of the Latin classes, has already resulted in several lively discussions between the pupils, making ancient topics very much alive.

Our Thanksgiving Festival included a Greek procession, which served as an admirable prelude to the subject of Greek clothing, to which Socrates refers in one of the talks to be read this month.

Latin Lessons for Ninth Grade

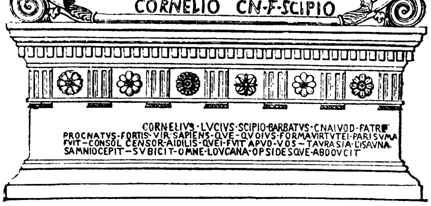
NUMBER III

Latin IX

1. Polyphemus Serenades a Mermaid.

Huc ades, O Galatea; quis est nam ludus in undis?
Hic ver purpureum, varios hic flumina circum
fundit humus flores, hic candida populus antro
imminet, et lentæ texunt umbracula vites.
Huc ades! insani feriant sine litora fluctus.
Vergilius.

2. The Epitaph of a Fair Roman.


CORNELIO CN·F·SCIPIO
CORNELIVS·LVCIVS·SCIPIO·BARBATVS·CNAIVOD·FATRE
PROCNATVS·FORTIS·VIR·SAPIENS·QVE·QVOIVS·FORMA·VIRTVTEI·PARISVMA
FVIT—CONSOL CENSOR·AIDILIS·QVEI·FVIT APVD·VOS—TAVRASIA·CISAVNA
SAMNIOCEPIT—SVBICIT·OMNE·LOVCANA·OPSIDESQVE·ABDOVCIT

No. 112. SEPULCRUM SCIPIONIS.
A Tomb in Rome.

Hospes, quod dico paulum est, adsta ac perlege.
Hic est sepulcrum hau pulchrum pulchræ feminæ:
nomen parentes nominārunt Claudiam;
suum maritum corde dilexit suo:
natos duos creavit: horunc alterum
in terrā linquit, alium sub terrā locat.
Sermone lepido tum autem incessu commodo
domum servavit, lanam fēcit. Dixi, abi.

Vocabulary of New Words

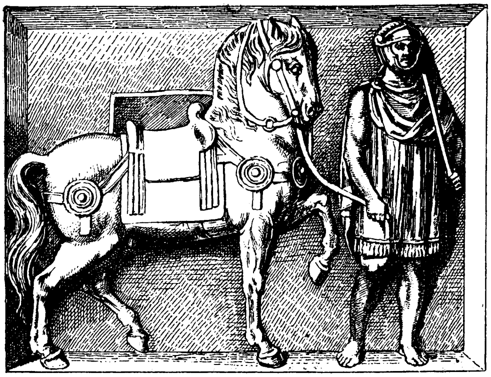
unda, ae,	*wave, water.*
ver, veris,	*spring-time.*
varius, a, um,	*varied, many-colored.*
flumen, inis, n.,	*river.*
circum,	*around.*
fundo, 3,	*pour forth.*
humus, i,	*ground, earth.*
flos, floris,	*flower, blossom.*
populus, i, f.,	*poplar tree.*
antrum, i,	*cave, grotto.*
lentus, a, um,	*tenacious, clinging, twining.*
umbraculum, i,	*shady bower.*

vitis, is, *vine.*
insānus, a, um, *mad.*
ferio, 4, *strike.*
sino, 3, *allow.*
litus, oris, *shore.*
fluctus, *wave, tide.*
hospes, itis, *host, guest, stranger.*
paulus, a, um, *small, little.*
adsto, 1, *stand by.*
sepulchrum, i, *tomb.*
hau = non
pulcher, chra, chrum, *beautiful.*
nomen, inis, n., *name.*
nomino, 1, *give a name, call.*
marītus, i, *husband.*
cor, cordis, n., *heart.*
natus, *son.*
creo, 1, *produce, bear.*
terra, ae, *earth.*
linquo, 3, *leave.*
loco, 1, *place.*
sermo, onis, *conversation, speech.*
lepidus, a, um, *charming, witty.*
incessus, *walk, bearing.*
commodus, a, um, *fitting, agreeable.*
servo, 1, *guard, keep.*

References: Harper's *Dictionary of Classical Literature and Antiquities,* under *Galatea, Polyphemus, Sarcophagus;* Guhl and Koner's *Life of the Greeks and Romans,* Sec. 77.

Latin X

A Long Ride



No. 113. EQUES ROMANUS.
From a Tombstone in Mayence.

Tarquinius Superbus, rex Romānus, Ardeam obsidēbat, ubi regii invenes qui in castris erant conviis interdum tempus terēbant. Forte cenantibus apud Sextum Tarquinium incidit de uxoribus mentio, et suam quisque laudābat miris modis. Inde Tarquinius Collatīnus dixit: "Verbis non opus est. Paucis horis scire possumus ceteris præstāre Lucretiam meam. Quin conscendimus equos visimusque præsentes nostrarum ingenia?"

"Age sanē!" dixērunt omnes.

Itaque citātis equis Romam vehuntur et regias nurus convivio vident tempus terentes. Pergunt inde Collatiam ubi Lucretiam, Collatīni uxorem, serā nocte inter ancillas lanam facientem inveniunt.

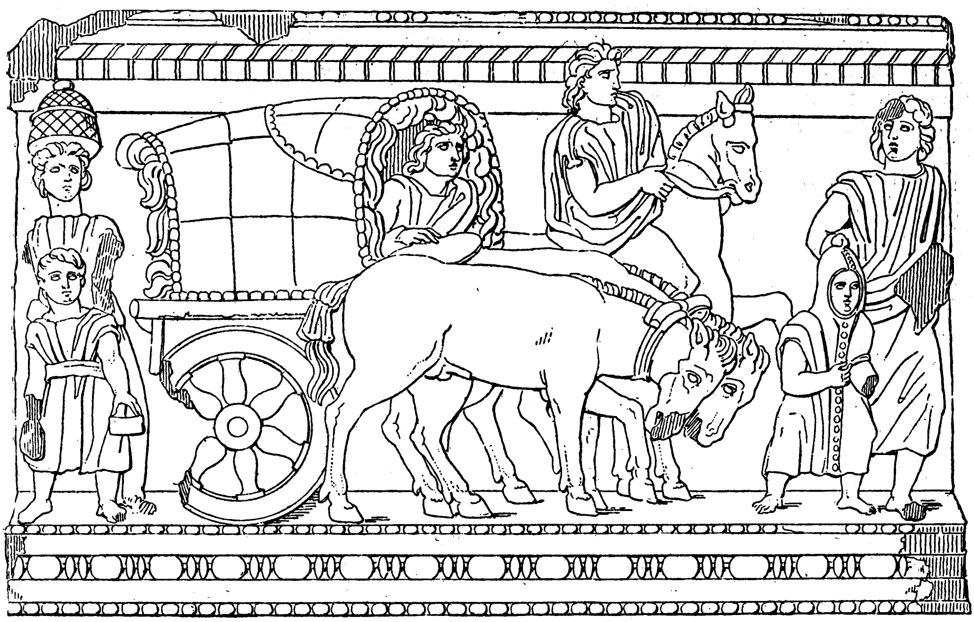
Vocabulary of New Words

rex, regis, *king.*
regius, a, um, *royal*
invenis, *young, youth.*
convivium, *banquet.*
tempus, oris, *time.*
tero, 3, *rub, wear away, spend.*
fors, fortis, *chance.*
ceno, 1, *dine.*
apud, prep., *with, at, at the house of.*
incido, 3, *fall in, happen.*
laudo, 1, *praise.*
mirus, a, um, *wonderful.*
verbum, i, *word.*
opus, eris, *work, need.*
scio, 4, *know.*
præsto, 1, *stand before, surpass.*
conscendo, 3, *mount.*
ingenium, *nature, character.*
citātus, a, um, *quick, at full speed.*
nurus, *daughter-in-law.*
pergo, 3, *press on.*
ancilla, *hand-maiden.*

Questions to be Answered in Latin

1. Quid dixit Collatīnus de uxore suā?
2. Quo modo iuvenes regii Romam ivērunt?
3. Quot fere horis equis citātis ab Ardeā Romam ire potuērunt?
4. Quot horis a Romā Collatiam ire potuērunt?
5. Quā fere horā Collatiam venērunt?
6. Quid faciebat Lucretia?

References: Harper's *Dictionary of Classical Literature and Antiquities,* under *Ephip-*



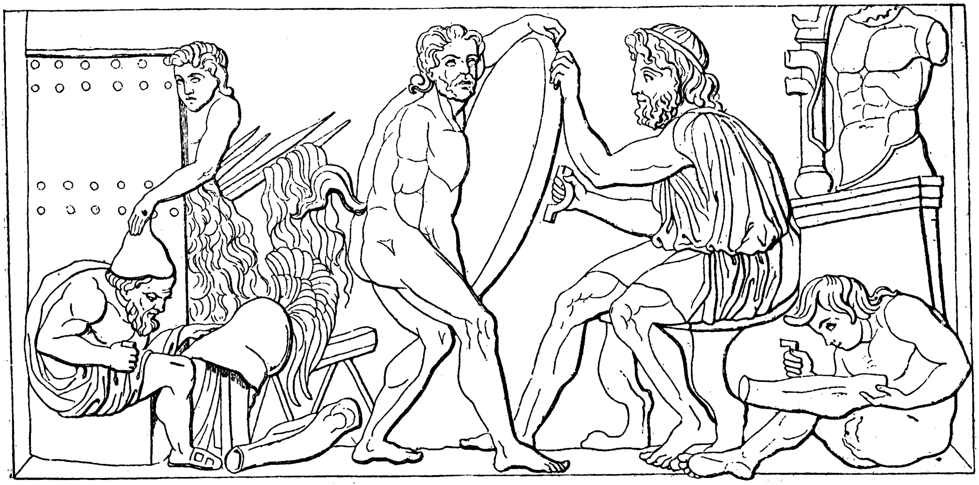
No. 114. VIATOR IN CARPENTO SEDENS.
From an Etruscan Relief.

pium; Rich, *Dictionary of Roman and Greek Antiquities*, under *Eques;* Smith's *Dictionary of Greek and Roman Geography*, under *Ardea, Collatia.*

Latin XI

A Lucky Omen

L. Tarquinius Priscus ab Tarquiniis cum fortunis omnibus Romam migrāvit. Postquam ad Ianiculum vēnit ei carpento cum uxore sedenti aquila pilleum aufert superque carpentum cum magno clangōre volitans rursus capiti apte repōnit. Tanaquil uxor, cælestium prodigiōrum perīta, alta sperāre virum iubet, qui postea regnum occupāvit.



No. 115. PUER PILLEUM FABRI AUFERT.
Hephaestus' Blacksmith Shop on a Greek Vase.

Vocabulary of New Words

migro, 1, *move, remove.*
aquila, *eagle.*
anfero, 3, *take away, carry off.*
clangor, ōris, *noise.*
volito, 1, *fly to and fro, flutter.*
caput, itis, *head.*
repōno, 3, *replace.*
perītus, a, um, *experienced, expert.*
altus, a, um, *high, lofty.*
spero, 1, *hope for, expect.*
iubeo, 2, *command, bid.*
regnum, *royal power.*
occupo, 1, *seize.*

Questions to be Answered in Latin

1. Ubi habitābat Tarquinius Priscus?
2. Quo modo migravit Romam?
3. Quid fecit aquila?
4. Quid dixit Tanaquil?
5. Hominesne in urbe Romā carpento vehebantur?

References: Harper's *Dictionary of Classical Literature and Antiquities,* under *Tarquinii, Tarquinius, Carpentum, pilleus;* Rich, *Dictionary of Roman and Greek Antiquities,* under *Carpentum, pileus;* Schreiber's *Atlas of Classical Antiquities,* Plate 62.

Latin XII

The Roman Women Help the State

Camillus dum Veios obsidet decimam partem prædæ Apollini vōvit. Sed urbe captā vōtum exsolvere Romani non potuērunt quia aurum satis non habuērunt. Deinde matrōnæ ad id consultandum convenērunt communique decrēto aurum et omnia ornamenta sua in ærarium detulērunt. Itaque ob eam munificentiam matrōnis pilento ad sacra ludosque, carpentis festo profestoque ire licuit.

Nunc mihi curto
Ire licet mulo vel si libet usque Tarentum.
—*Horatius.*

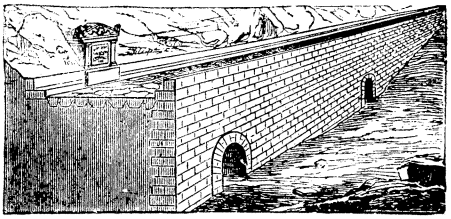
Vocabulary of New Words

decimus, a, um, *tenth.*
præda, *booty.*
voveo, 2, *vow;* vōtum, *a vow.*
exsolvo, 3, *pay off.*
convenio, 4, *come together.*
decrētum, *decision.*
ærarium, *treasury.*
defero, 3, detuli, *carry down, carried down.*
munificentia, *liberality.*
licet, *is allowed.*

No. 116. VIATOR CANPONÆ PRO CIBO SOMNOQUE PECUNIAM DAT.
From a Tombstone in Italy.

Questions to be Answered in Latin

1. Quid fēcit Camillus dum Veios obsidet?
2. Cur Romani votum non exsolvērunt?
3. Quid fecērunt matronæ?
4. Quem honorem eis dedit senatus?
5. Quo modo ferebantur aliæ feminæ in urbe Romā?
6. Quo modo Horatius poeta usque Tarentum ire potuit?
7. Quot diēbus Tarentum ire potuit?
8. Ubi potuit viator cibum somnumque capere?
9. Qui primus viam publicam munīvit?



No. 117. VIA APPIA.
From Guhl and Koner's Life of the Greeks and Romans.

References: Harper's *Dictionary of Classical Literature and Antiquities,* under *Veii, Apollo, Ludi, Caupōna, Via;* Rich, *Dictionary of Roman and Greek Antiquities,* under *Pilentum, Via;* Guhl and Koner's *Life of the Greeks and Romans,* Secs. 104, 105 and 71.

Latin Lessons for Ninth Grade

Number IV

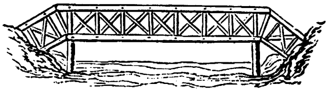
Latin XIII

Horatius at the Bridge

Ancus Martius, rex Romanōrum, Ianiculum urbi ponte sublicio coniunxit, qui postquam reges expulsi sunt iter pæne hostibus dedit. Nam Porsena Clusīnus rex repentīno impetu Ianiculum cēpit et infesto exercitu ad pontem vēnit, cuius extrēmam partem Horatius Cocles unus occupāvit. Is vir hostium impetum sustinuit dum pons a tergo interrumpitur. Tum ponte interrupto Cocles, "Tiberine pater," inquit, "te precor, hæc arma et hunc militem propitio flumine accipias." Ita sic armatus in Tiberim desiluit incolumisque ad suos tranavit.

Vocabulary of New Words

coniungo, 3, *unite.*
iter, itineris, *route, way.*
hostis, is, *enemy.*
repentīnus, a, um, *sudden.*
impetus, *attack.*
infestus, a, um, *hostile.*



No. 118. PONS SUBLICIUS.
From the Column of Antoninus.

interrumpo, 3, *break down.*
precor, 1, *pray.*
flumen, inis, *stream.*
desilio, 4, *leap down.*
incolumis, *safe.*
trano, 1, *swim across.*

Questions to be Answered in Latin

1. Qui primus pontem sublicium fēcit?
2. Quibus hostibus iter pæne dedit is pons?
3. Qui sustinuit impetum hostium?
4. Quid dixit Cocles Tiberino patri?
5. Quo modo Cocles ad suos venit?
6. Potuitne populus Romanus sine pontibus viisque imperium suum constituere?

No. 119. PONS ÆLIUS.
The Ponte S. Angelo, from Guhl and Koner's
Life of the Greeks and Romans.

References: Harper's *Dictionary of Classical Literature and Antiquities*, under *Cocles, Clusium, Porsena, Pons, Via;* Rich, *Dictionary of Roman and Greek Antiquities*, under *Pons, Sublicius, Via;* Guhl and Koner's *Life of the Greeks and Romans*, Secs. 71 and 72; Macaulay's *Horatius.*

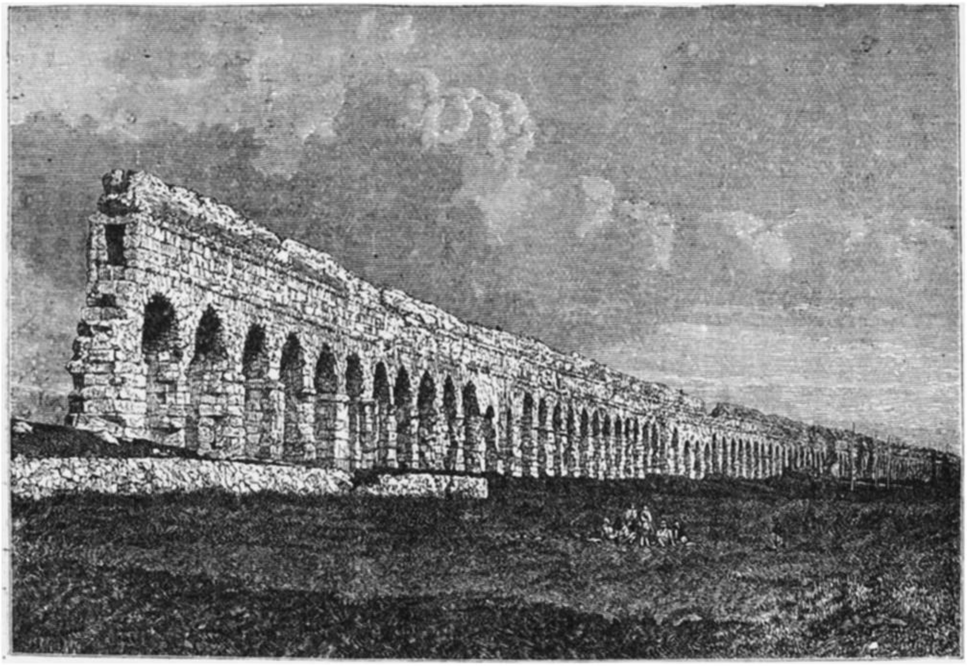
Latin XIV

A Recreant Roman Maiden

Sabini Romulo regnante arcem Romanam obsēdērunt, cui Tarpeius præerat, et Tarpeia, filia sua, dum aquam extra mœnia petit armillas aureas gemmatosque anulos vidit quos Sabini in bracchiis lævis gerebant. Eorum ornamentorum avida puella Romana dixit Sabinis, "Si id dabitis quod in bracchiis lævis geritis, vos in Capitolium ducam." Sed ubi in arcem ivērunt puellam scutis obruerunt quia et illa in lævis gerebant.

Dominus servum iubet:

Tu qui urnam habes, aquam ingere, face
plenum aënum sit cito. *Plautus.*



No. 120. AQUA CLAUDIA.
A Roman Aqueduct To-day, from Duruy's History of the Romans.

No. 121. PUELLÆ GRÆCÆ URNAS FERENTES.
From a Greek Vase.

Vocabulary of New Words

regno, 1, *reign, rule.*
arx, arcis, *citadel.*
præsum, *be in front, be in command.*
extra, prep. with acc., *outside.*
mœnia, ium, *fortifications, walls.*
peto, 3, *seek.*
armilla, æ, *bracelet.*
anulus, i, *ring.*
lævus, a, um, *left.*
avidus, a, um, *eager for.*
scutum, i, *shield.*
aënum, i, *copper vessel.*

Questions to be Answered in Latin

1. Ubi petivit Tarpeia aquam?
2. Quo modo eam ferebat?
3. Quorum ornamentorum avida fuit puella?
4. Qua arma ei dabant Sabini?
5. Ubi petēbant servi aquam postquam ea in urbem ducta est?
6. Qui primus aquam in urbem duxit?

References: Harper's *Dictionary of Classical Literature and Antiquities,* under *Aquæ Ductus, Fons, Tarpeia;* Guhl and Koner's *Life of the Greeks and Romans,* Sec. 74; Schreiber's *Atlas of Classical Antiquities,* Plate 67 and 68.

Physiography: Ninth Grade (WALLACE W. ATWOOD.) — During the fall quarter the work in this course was a study of the geographic environment of Chicago. Whatever was done in the class-room was based on the field study carried on during the early part of the quarter, with the aim of having the students understand and appreciate what was going on about them.

These same students are studying Grecian history and the Latin language, and therefore it is desirable that they have an appreciation of the physiographic conditions in those regions where the Greek and Roman civilizations developed.

For this reason the attention of the class, in this course, will be focused on the physiography of the Mediterranean Sea region, including not only a study of the physical geography of the land, but a consideration of the climatic and hydrographic conditions in that part of the world.

The general geography has been covered, somewhat fully, with the students of this grade, in the other courses, and our investigations will begin with a study of the climate:

I. Elements of climate, or what we want to know about the climate of any region.

1. Temperature: (a) Average. (b) Average yearly range. (c) Average daily range (d) Average during the growing period. (e) Average during cold period. (f) Secure similar data for Greece and Italy.

2. Rainfall: (a) Total annual amount. (b) Distribution throughout the year. (c) Distribution over surface. (d) Rainfall for Greece and Italy.

3. Winds: (a) Prevailing winds, direction and average velocity. (b) Periodic winds, direction and average velocity. (c) Special storm winds. (d) Winds for Greece and Italy.

II. Factors which influence climate.

1. Latitude.
2. Altitude.
3. Relation to sea: (a) Distance from sea. (b) Where there are warm currents. (c) Where there are cold currents. (d) Relation of Greece and Italy to sea.
4. Relation to physical features: (a) On windward or leeward side of high mountains. (b) On windward or leeward side of great plains or deserts. (c) Windward and leeward sides of Greece and Italy during different seasons.
5. Position relative to wind belts or storm tracts. Special changes in southern Europe during the year.

III. Keeping of weather records.

1. The Thermometer: (a) Fahrenheit. (b) Centigrade. (c) The fixed points and how to determine them. (d) Comparison of degrees. (e) Special thermometers for extremes of temperature. (f) Maximum and minimum thermometers. (g) The thermograph.
2. The Barometer: (a) Making of the barometer. History of the experiment. (b) Aneroid barometers.
3. Anemometers.
4. The Rain-gauge.

5. Recognition of different cloud forms: (a) Cirrus. (b) Cirro-stratus. (c) Cirro-cumulus. (d) Alto-stratus. (e) Stratus. (f) Cumulus. (g) Alto-cumulus. (h) Nimbus. (i) Cumulo-nimbus.

IV. The weather map.

1. The isobars.
2. The isotherms.
3. The devices for showing on the map, clear or cloudy conditions, rain or snow, direction of wind.
4. The areas marked "Low": (a) Arrangement of pressure. (b) Arrangement of temperature. (c) Arrangement of winds.
5. The areas marked "High": Same analysis as for "Low."
6. Weather conditions in "Low" and in "High."

V. Circulation of the atmosphere.

1. Observations based on wind charts: (a) The calm belts. (b) The trade wind belts. (c) The belts of westerlies. (d) The low-pressure belts. (e) The high-pressure belts. (f) Countries located in these different belts. (g) In which belt is Greece? In which belt is Italy?
2. Explanation of these facts.
3. Some more observations: (a) Monsoon winds. (b) Land and sea breezes. (c) Cyclonic winds. (d) Anticyclonic winds. (e) Typhoons. (f) Tornadoes. (g) Hurricanes. (h) Chinooks. (i) Northers. (j) Countries located where these periodic winds blow. (k) Storms of southern Europe.
4. Explanation of these observations.
5. Influence of the storms on mankind.

References: Davis, *Physical Geography;* Tarr, *First Book in Physical Geography;* Davis, *Elementary Meteorology;* Waldo, *Meteorology.* The Government weather maps.

Art Expression Work in Physiography: NINTH GRADE: I. Water-color paintings of various cloud forms.

II. Water-color paintings of various landscapes typical of:

1. Arid or desert region.
2. Prairies.
3. Steppes.
4. Tundras.
5. Well-watered mountain-sides.
6. Poorly watered mountain-sides.
7. Forests of temperate zones.
8. Tropical forests.

III. Chalk modeling of landscapes similar to those chosen for painting.

History: (GUDRUN THORNE-THOMSEN.) The work in History in Ninth, Tenth, and Eleventh Grades for the months of January and February will be a continuation of the course outlined for December, and will cover the period in Greek history following the Homeric Age and extending to the Persian wars.

Particular attention will be given to the evolution of government and the growth of institutions both social and political as they gradually unfolded themselves during this period from their beginnings in prehistoric times. The different forms of government will be studied in their relation to the life of the people, as an expression of social ideals and tendencies; e. g., in Athens, where the struggle toward democracy reflected the whole social organization and progress of the city.

For the study of the topics outlined below the pupils will be referred to chapters in their text-book, Botsford, *A History of Greece*, as well as to books in the library (see list of references in December outline). These topics will be taken up in a logical or chronological order, as suggested by the text-book, only in so far as it agrees with the progress and needs of the class at the time; they do not present the whole scope of the work, but rather the essential points around which the discussion will center. Facts concerning the period will be obtained from books, but generalizations, inferences, and estimates of persons and events will be worked out by the pupils themselves.

In order better to understand the powers of the various political bodies, the class will organize itself into a monarchy, oligarchy, or democracy, as the case may be. Lawsuits may be brought before the courts and new laws proposed, the pupils endeavoring to dramatize the scenes as they actually took place.

To make the picture of the life of the

Greeks vivid, we shall imagine ourselves in Sparta or Athens and see the people in their daily pursuits dressed in the costumes of the time. We shall go to the market-place and listen to the talk of the towns-men; visit the courts, and also the town hall where the sacred fire is burning; attend the meetings of the council and the assembly; and in general watch the life of the Athenian or Spartan at home and in public places. At the harbor of Athens, the vessels as they come in and go out will give us an idea of the commerce of the city. We shall go on board one of these vessels and set sail for some of the distant colonies. In the schools we shall see what the children and youths are doing, and in the temples learn of the religious worship of the people. From what we see we shall make inferences concerning the government of the city and endeavor to trace its development.

In this study the following outline is suggested:

What determines the formation of the Greek state? The city as the political unit in Greece. The evolution and organization of the city state. The cohesive force in early Greek society, religious worship, and kinship. The walled city and its relation to surrounding country. Comparison between our modern state and the Greek. Geographical conditions favoring the formation of city states. Function of the king in early Greek society. Rights of the king limited by the council, showing position and power of the nobility. Limited by the assembly, showing political rights of the masses. Limited by traditional customs.

Compare Greek monarchies with despotic monarchies of the East.

The pupils will work out a map showing extent of the Greek world. Founding of colonies; reasons for colonization, commercial, political, etc. Relation of colonies to parent city; organization of a colony; Greek method of colonization compared with that of modern countries. Influence of Greek colonization on the progress and civilization of the world.

Was Hellas a geographical unit? A political unit?

Difficulties in the way of political federation.

Why was the local interest of the Greek city state so strong? Reference to the geography of Greece.

Present physical map of Greece, showing isolated areas; diversity in resources and occupations, and consequent variety of interest of the city states.

Co-operation of states for religious purposes: (a) The Delian League; (b) The Delphic Amphictyony. How religious leagues became political hegemony. The Peloponnesian League. Compare this loose union of states with the United States. What made the states of Greece with their colonies feel like one nation? Elements of Hellenic unity. Language and literature. The Homeric poems. Common religion. Religious festivals; the Delphic oracle; Olympic games. Customs, manners, culture, and art. Stage of civilization reached by surrounding peoples (barbarians).

ATHENS: Myths concerning the beginnings of the city. How Attica became a state; its organization and the influence of Athens. Geography of Attica. Importance of Acropolis in early times. Steps in the evolution of the government of Athens from monarchy to democracy. Efforts of the nobles to reduce king's power. Knightly aristocracy or oligarchy. Transition from oligarchy to timocracy. Division of people into four classes. Political power determined by wealth. Party strife. Sectional classes of Athens. The nobles as custodians of laws. Draco's work for Athens. His laws of homicide.

Growth of commerce and industries. Economic misery of the lower classes. The legislation of Solon. Changes in the constitution.

Rights of the political parties under Solon. Did the constitutional reforms of Solon bring about a democracy? What class had still the controlling power in Athens? Solon's own account of his work. Compare political institutions of Athens with those in our own country.

Pisistratus, the tyrant. Benefits conferred on the Greek commonwealth by the tyrannies. Advantages to the Greek people of gradual transition from oligarchy to democracy. Difference between king and tyrant. Pisistratus' work for Athens. Growing appreciation of Solon's constitution by the masses.

Clisthenes as the founder of democracy in Athens. Constitutional reforms introduced by Clisthenes. Public work without compensation; consequences. Effect of these reforms on the people of Athens as shown in succeeding events.

SPARTA. Myths concerning beginnings of the city; the Dorian migrations. Relation of Spartans to conquered people. Compare with Athens. Political rights of outside country. The three classes.

The position of the Spartans in Lacedæmon was like that of a garrison in a hostile country; the whole social and political structure was adapted accordingly, and war became the business of life. Entire subordination of the individual and the family to the state. How the state provided for the individual. Cultivation of the land by the helots. Aims and methods of Spartan education. Political organization. The dual kingship. Power of the kings of the council and assembly. The five ephors. Sparta as an aristocracy. In what sense was it a democracy?

As Sparta and Athens represent entirely different ideals in government, a close comparison between the two cities will be made. Influence of the two cities upon Greece. Communistic organization of Spartan society. Individualistic organization of Athenian society. Effect on material progress and attitude toward work in the two states.

Art in Connection with History: (JOHN DUNCAN.) Taking the Mycenæan pottery as the inspiration, the students of the First, Second, and Third years will mold and decorate vases, candlesticks, flowerpots, and jardinières. The students will first be familiarized with the form of pottery belonging to that age through the medium of pictures and slides, and will then proceed to adapt them to their own uses, and to invent new patterns for themselves.

German:

Die Loreley.

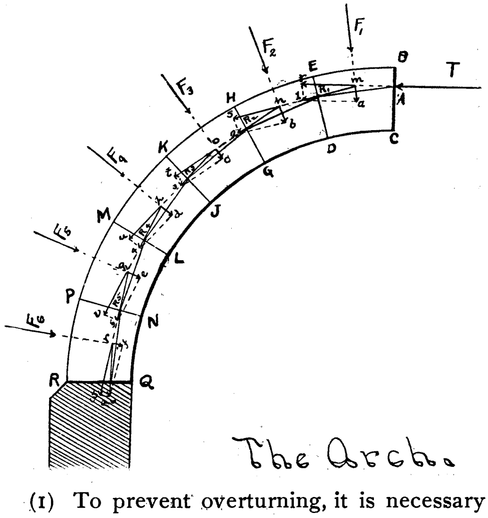
Ich weiß nicht, was ſoll es bedeuten,
Daß ich ſo traurig bin;
Ein Märchen aus uralten Zeiten,
Das kommt mir nicht aus dem Sinn.
Die Luft iſt kühl, und es dunkelt,
Und ruhig fließet der Rhein;
Der Gipfel des Berges funkelt
Im Abendſonnenſchein.

Die ſchönſte Jungfrau ſitzet
Dort oben wunderbar;
Ihr gold'nes Geſchmeide blitzet,
Sie kämmt ihr goldenes Haar.
Sie kämmt es mit goldenem Kamme
Und ſingt ein Lied dabei,
Das hat eine wunderſame,
Gewalt'ge Melodei.

Den Schiffer im kleinen Kahne
Ergreift es mit wildem Weh';
Er ſchaut nicht die Felſenriffe,
Er ſchaut nur hinauf in die Höh'.
Ich glaube, die Wellen verſchlingen
Am Ende Schiffer und Kahn:
Und das hat mit ihrem Singen
Die Loreley gethan.

Heinrich Heine.

Mathematics: (GEORGE W. MYERS.) I. Geometry: The special work of this grade being the study of Greece, the geometry of certain architectural forms will be taken up. Chief among these forms will be the arch, the truss, the column, and the dome. The half-arch shown in the figure is held in equilibrium by the horizontal thrust T, the reaction of the right half of the arch. The block B, C, D, E is held in equilibrium by the forces T, F, and the reaction of the block E, D, G, H (called *Voussoir*). Each Voussoir is in a similar condition to this, the direction, intensity and point of application of the reactions R_1, R_2, R_3, etc., being determined by the principle of the *parallelogram*, or *triangle of forces*. (See October and November COURSE OF STUDY under Pedagogic School). The Criteria of Safety for an arch are:



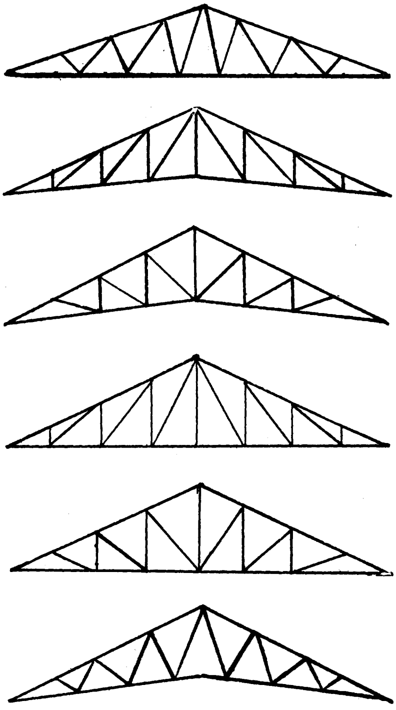
The Arch.

(1) To prevent overturning, it is necessary that the line of resistance, A, R_1, R_2, R_3, R_4, R_5, R_6, shall lie everywhere between the arcs C, D, G, J, L, N, Q (the *intrados*) and B, E, H, K, M, P, R (the *extrados*).

(2) To prevent crushing, the line of resistance must cross the joint far enough from the edge so that the maximum pressure shall be less than the crushing strength of the stone.

(3) To prevent sliding, the angle between the line of resistance and the normal to the joint must be less than the angle of friction of the surfaces.

The truss will be taken up with sufficient detail to show how the forces act within and upon it, and the geometry that underlies its construction. The dome is an arch revolved about its vertical axis through 180°. Some of the simpler forms of trusses are given here.



This with some remarks on the column will show the need of a study of the triangle and allied rectilinear figures, and necessitate about as much as is usually given in Book I.

As the study of the geography of Greece necessitates a knowledge of local environment, the field-work in geometry will be directed toward the construction of a careful topographic map of a local area, perhaps of the south end of Lincoln Park. The geometry will be worked out of the problems which grow out of the field-work, after the manner suggested by the three propositions below.

(4) Any two geometrical figures, such as lines, angles, triangles, quadrilaterals, etc., are said to be equal if when superposed they coincide throughout. (Congruency.)

The lines, angles, etc., which make up a geometrical figure are called its *parts*. Parts which are similarly situated with respect to the lines, angles, etc., of a figure are called corresponding or homologous *parts*.

The corresponding parts of equal figures are obviously equal.

When two lines cross, or cut, each other they are said to *intersect*.

How many straight lines can be drawn through a single point?

How many straight lines can be drawn through two fixed points?

Can a straight line always be drawn through two fixed points?

A line is said to be *determined* by points when one line, and only one, can be drawn through them.

What is the least number of points which will determine a straight line?

Can three points ever determine a line? Why do they not always?

Points are *located*, or *fixed*, on paper by means of pen or pencil dots; on the blackboard, by crayon dots; on the ground, by chaining-pins or flag-poles; a straight line is *located*, or *fixed*, on the ground by fixing two points lying in it.

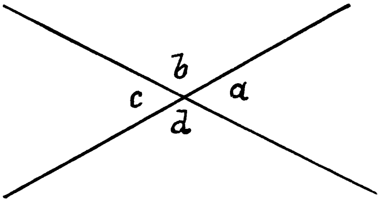
Field-Work: Locate two intersecting straight lines on the surface of a level tract of ground, and set up a compass, or plane table, over the point of intersection. Measure carefully all four of the angles. What angles are equal?

Remark: A very useful plane table can be made at an expense not to exceed $1.50 by screwing to a 75-cent flat-topped camera tripod a light drawing-board, and using a small 25-cent level, which can be had of any hardware dealer, to level up with. A cheap (5-cent or 10-cent) foot-rule with needles set vertically in it will serve for an *alidade*, or sight.

Drawing Exercise: Draw two intersecting straight lines on paper, and with a protractor measure all four angles. Which angles are equal?

When two straight lines meet, the two angles lying on opposite sides of the same line are called adjacent angles, as a and b, or a and d, etc.

Two angles lying on opposite sides of both lines are called opposite, or vertical, angles, as a and c, or b and d.

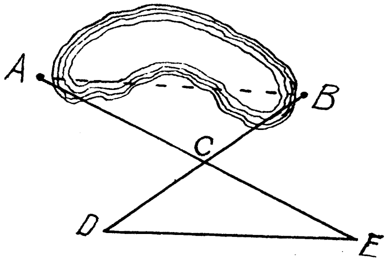


Exercise: Cut the paper along the two intersecting lines, and fit the angles over each other, and state in geometrical terms which angles are equal.

Demonstration

PROPOSITION I: *Opposite, or vertical, angles are equal.* Prove.

Let it be desired to find the length, A, B, of the lagoon.



Field-Work: Let flag-poles be set up at A, B and some convenient third point, C. Prolong the lines BC and AC through C, making CD equal to BC and CE to AC. Set up poles at D and E and chain the distance DE.

Drawing Exercise: Draw on paper three lines, such as AB, AC, and BC, then prolong AC and BC, as above, until CE and CD are equal respectively to AC and BC. Draw DE, and cut out the figure CDE. Can you place it upon ACB so that it will fit? What relation holds between DE and AB?

Try this same exercise, prolonging AC to E, making CE equal to BC, and extending BC to D, making CD equal to AC, and connecting DE. Cut out the figure CDE, and fit it over ACB as before. What relation between DE and AB?

In both cases what parts of the triangles were constructed equal? What principle does your experiment seem to show?

Define proposition and demonstration, and illustrate the definitions by the following:

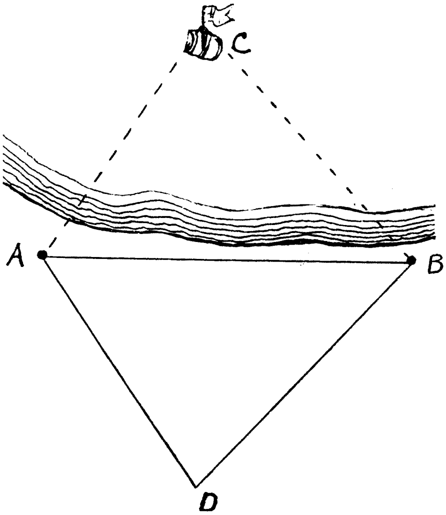
Demonstration

PROPOSITION II. *When two sides and the included angle of one triangle are equal respectively to two sides and the included angle of another, the triangles are equal.* Prove.

Remark: The substance of this proposition is sometimes stated thus: A triangle is *determined* by two sides and the included angle.

Query: Can you draw and cut out any triangles having the same two sides and included angles which will not exactly fit over each other, or *coincide?*

Find the distances from the buoy, C, to the points A and B on shore.



Field-Work: Locate the line AB by placing flag-poles at A and B, or at any other two (why two?) points along AB. With a plane table, or compass, set up over A, measure the angle CAB, and set a flag-pole out along the direction AD, making BAD equal to CAD. Similarly at B, measure angle ABC, and set a flag-pole out in the direction BD, so that ABD shall equal ABC. Then prolong AD and BD until they intersect, and set a pole at the point of intersection. Finally, chain AD and BD.

Drawing-Work: With ruler and protractor draw this figure in small with as great accuracy as possible. Cut the paper along the lines AD and BD, and fold the figure ADB over the line AB, bringing it into the plane of the figure ACB. Does ADB fit closely (coincide with) ACB?

Would the problem have been solved by making angle BAD equal to angle ABC, and angle ABD equal to angle BAC? What line would you then have measured for BC? for AC?

In the field-work, what particular parts were measured? Upon what common feature does the equality of the two triangles ACB and ADB seem to depend here?

Demonstration

PROPOSITION III: *If two angles and the included side of one triangle are equal respectively to two angles and the included side of another, the triangles are equal.* Prove.

II. **Algebra:** The great superiority of the methods of algebraic analysis over those of arithmetic in dealing with complicated numerical relations is perhaps sufficient reason in itself for retaining algebra as a part of the common school course. To many this is the only office algebra ever performs; but this is not the most important function of the subject. The fact that it is fundamental to all more advanced mathematical studies, including Physics, Mechanics, Astronomy, and all the engineering sciences, has led some to think that it is the most needed, and from lack of skill in handling it is the least used of the modern industrial fabric. Substantially all there is of Trigonometry is derived from the algebraic transformation of the following six simple relations: $s^2+c^2=1$; $t=s/c$; $T=1/t$; $S^2=1+t^2$ and $C^2=1+T^2$; $v=1-c$.

Assuming these relations, prove the following equations:

(1) $\frac{t-s}{s^3}=\frac{S}{1+c}$;

(2) $ct+sT=s+c$;

(3) $(2-v)\,v=s^2$;

(4) $\frac{c}{sT^2}=t$;

(5) $(t+T)\,sc=1$;

(6) $(S^2-1)\,(C^2-1)=1$;

(7) $SC\,(c^2-s^2)=T-t$;

(8) $(s+c)\,(t+T)=S+C$;

(9) $T+\frac{s}{1+c}=C$;

(10) $s\,(S+C)-c\,(S-C)=SC$;

(11) $(C-T)^2=\frac{1-c}{1+c}$;

(12) $(1+t^2)\,(1-T^2)=S^2-C^2$;

(13) $\frac{t-T}{t+T}=\frac{2}{C^2}-1$;

(14) $S^2\,C^2-2=t^2+T^2$;

(15) $T-SC\,(1-2s^2)=t$;

(16) $C\,(S-1)-T\,(1-c)=t-s$;

(17) $v\,(S+1)+(1-s)\,(C+1)=st+cT$;

(18) $\frac{v\,(1+S)}{s}+\frac{(1-s)\,(1+C)}{c}=SC$;

(19) $s^2\,(t^2-1)+c^2\,(T^2-1)=(1-2c^2)^2\,S^4$;

(20) $c^4-s^4=c\,(1-t)\,(s+c)$.

Eleventh and Twelfth Grades

American History in the Twelfth Grade: (EMILY J. RICE.) The Revolutionary Period is our subject of study for January. Much original material may be found for this work in Hart's *Contemporaries and Source Book*, American History Leaflets, Old South Leaflets, and *Source Extracts*, by Caldwell.

To illustrate the different methods of argument of the English statesmen on the one hand and the American on the other in regard to taxation, a few other extracts from original material have been selected. Our aim is to show the theoretical reasoning of the Americans in contrast to the practical thought of the English. These selections, with some illustrations of the spirit of the times, are given below. Extracts from Locke's *Treatise on Civil Government* may also aid in this work.

DISCUSSION OF THE STAMP ACT IN THE BRITISH PARLIAMENT

George Grenville: "The colonies have a right to demand protection from parliament, and parliament, in return, has a right to enforce a revenue from the colonies; protection implies an army, an army must receive pay, and pay requires taxes; on the peace, it was found necessary to maintain a body of ten thousand men at a cost exceeding three hundred thousand pounds, most of which was a new expense; the duties and taxes already imposed or designed would not yield more than one hundred thousand pounds, so that England would still have to advance two-thirds of the expense; it was reasonable for the colonies to contribute this one-third part of the expense necessary for their own security." (Adapted.)

Jackson : " The parliament may choose whether they will tax America or not; they have a right to tax Ireland, yet do not exercise that right. Still stronger objections may be urged against their taxing America. Other ways of raising the moneys there requisite for the public service exist, and have not yet failed; but the colonies in general have with alacrity contributed to the common cause. It is hard all should suffer for the fault of two or three. Parliament is undoubtedly the universal, unlimited legislature of the British dominions, but it should voluntarily set bounds to the exercise of its power; and if the majority think they ought not to set these bounds, then they should give a share of the election of the legislature to the American colonies, otherwise the liberties of America, I do not say will be lost, but will be in danger; and they cannot be injured without danger to the liberties of Great Britain."

For the argument of William Pitt, see Hart's *Contemporaries*, vol. 2, p. 404.

THE STAMP ACT AS DISCUSSED BY AMERICAN COLONISTS

Virginia House of Burgesses. Resolutions written by Patrick Henry, and adopted:

Resolved, That the first adventurers and settlers of this, his majesty's colony and dominion, brought with them and transmitted to their posterity, and all other of his majesty's subjects, since inhabiting in this his majesty's said colony, all the privileges, franchises, and immunities that have been at any time held, enjoyed, and possessed by the people of Great Britain.

Resolved, That by two royal charters granted by King James the First, the colonists aforesaid are declared entitled to all the privileges, liberties, and immunities of denizens and natural born subjects to all intents and purposes, as if they had been abiding and born within the realm of England.

Resolved, That the taxation of the people by themselves, or by persons chosen by themselves to represent them, who can only know what taxes the people are able to bear, and the easiest mode of raising them, and are equally affected by such taxes themselves, is the distinguishing characteristic of British freedom, and without which the ancient constitution cannot subsist.

Resolved, That his majesty's liege people of this most ancient colony, have uninterruptedly enjoyed the right of being thus governed by their own assembly in the article of their taxes and internal police, and the same hath never been forfeited, or any other way given up but hath been constantly recognized by the King and people of Great Britain.

Resolved, therefore, That the general assembly of this colony have the sole right and power to lay taxes and impositions upon the inhabitants of this colony; and that every attempt to vest such power in any persons whatsoever, other than the general assembly aforesaid, has a manifest tendency to destroy British as well as American freedom. (Fifth rescinded.)

Plymouth Town Meeting: "This place, sir, was at first the asylum of liberty, and we hope will ever be preserved sacred to it, though it was then no more than a barren wilderness, inhabited only by savage men and beasts. To this place our fathers (whose memories be revered), possessed of the principles of liberty in their purity, and disdaining slavery, fled to enjoy those privileges which they had an undoubted right to, but were deprived of by the hands of violence—oppression in their native country. We, sir, their posterity, the freeholders and other inhabitants of this town, legally assembled for that purpose, possessed of the same sentiments and retaining the same ardor for liberty, think it our indispensable duty on this occasion to express to you these our sentiments of the stamp act, and its fatal consequences to this country, and to enjoin upon you (delegates), as you regard not only the welfare, but the very being of this people, that you (consistent with our allegiance to the King and relative to the government of Great Britain), disregarding all proposals for that purpose, exert all your power and influence in opposition to the stamp act, at least till we hear the success of our petitions for relief. We, likewise, to avoid disgracing the memory of our ancestors, as well as the reproaches of our own consciences, and the curses of posterity, recommend it to you to obtain if possible in the honorable house of representatives of this Province, a full and explicit assertion of our rights, and to have the same entered on their public records, that all generations yet to come may be convinced that we have not only a just sense of our rights and liberties, but that we never with submission to Divine Providence will be slaves to any power on earth."

For the Stamp Act Congress, see Hart's *Contemporaries*, Vol. II, p. 402. See also *Principles and Acts of the Revolution.*

General Gage's letter, written at New York: "It is difficult to say, from the highest to the lowest, who has not been accessory either by writing or by mutual agreements to oppose the act, by what they are pleased to term all legal opposition to it. Nothing effectual has been proposed either to prevent or quell the tumult.

"The rest of the provinces are in the same situation as to a positive refusal to take the stamps, and threatening those who shall take them to plunder and murder them; and this affair stands in all the provinces that unless the Act, from its own nature enforce itself, nothing but a very considerable military force can do it."

THE REPEAL OF THE STAMP ACT

English Parliament, House of Lords. Lord Shelburne: "Before we resolve upon rash measures, we should consider first the expediency of the law and next our power to enforce it. The wisest legislators have been mistaken. The laws of Carolina, though planned by Shaftesbury and Locke, were found impracticable and are now grown obsolete. The Romans planted colonies to increase their power; we, to extend our commerce. Should the regiments in America, at Halifax or Pensacola, embark at once upon the same destination, and no intervening accident disappoint the expedition, what could be effected against colonies so populous and of such magnitude and extent? The colonies may be ruined first, but the distress will end with ourselves."

Halifax, and others: "Protection without dependence and obedience is a solecism in politics. The connection between Great Britain and her colonies is that of parent and child. For the parent not to correct the undutiful child would argue weakness. The duty to enforce obedience cannot be given up, because the relation cannot be destroyed. The King cannot separate his colonies any more than any other part of his dominions from the mother country, nor render them independent of the British legislature. The laws and constitution of the country are prior and superior to charters, many of which were issued improvidently and ought to be looked into."

"The eyes of all the House turned upon Pitt as he rose in his place; the Americans present in the gallery gazed at him as at the appearance of their good angel or savior." (Bancroft.)

Pitt: (He had said that his resolution was taken.) "If I can crawl or be carried, I will deliver my mind and heart upon the state of America. I approve the address in answer to the King's speech; for it decides nothing and leaves every member free to act as he will. The notice given to parliament of the troubles was not early and it ought to have been immediate. I speak not with respect to parties. I stand up in this place single, unsolicited and unconnected. As to the late ministry, every capital measure they have taken is entirely wrong." See Bancroft, Vol. III, p. 175.

Burke's *Conciliation with America* will be the literature study for the period.

Art in Connection with History: (JOHN DUNCAN.) The students of the fourth year High School will devote themselves during this quarter to the making of decorative and illustrative pictures for their own and other rooms of the school. They will also assist the general committee on decoration in arranging the building for special exercises and festivals. This will involve work in very various directions, making a considerable demand for originality, and as much of it will be on a large scale the students will gain in confidence or facility.

Latin, Eleventh Grade: (ALLEN W. GOULD.) We had planned to begin Cicero's first oration against Catiline the first of December, but we did not do so until the middle of the month. We took more time with Sallust, for the sake of bringing out clearly in the speeches of Cæsar and Cato the meaning of the Roman Senate as a great school where the Romans could be educated to govern themselves and so govern the whole world, by hearing all sides of each subject freely discussed. Then the question naturally arose, what power should govern the governors of the province, and why had this great and growing domain of law and order no representative government like our own?

The careful study of these two great and opposing characters — Cæsar and Cato — prepares the student to anticipate what their views will be in the crisis. And as we pass into Cicero's orations we meet another character, and are to look at the same crisis through his eyes. This way of approach seemed to give the pupils a keen interest in finding out what Cicero's views and reasons would be. It also makes his oration seem easy to them to know what he was talking about, as his original hearers did.

In connection with the first oration, it is necessary to investigate the case of the Gracchi and try to see what their attempts meant. This helps the students to get more light on the crisis and see how long it had been developing. The pupils are also asked to study Cæsar in English by reading an article in an encyclopedia, and then Cæsar's life by Plutarch, and comparing it with Fowler's *Cæsar* and Mommsen's account of the same period. Besides this, each student is requested to be responsible for one other life by Plutarch, either that of Cato or of Cicero or of Pompey.

The geography thus far has been confined to the movements of Catiline in Italy and the significance of the Alps and Apennines as a double barrier for Roman civilization.

General Geology, Eleventh Grade: (WALLACE W. ATWOOD.) The work of this course as outlined for December was not completed during that month, and the work this month will be a further consideration of the physiographic areas of the eastern portion of the United States, following the outline published in the December number.

Art Expression Work in General Geology: I. Water-colored paintings of landscapes chosen from the eastern portions of the United States.

1. Coast scenes in New Jersey and North Carolina.
2. Coast scenes in New England.
3. Inland on the coastal plain.
4. Inland in the New England region.

II. Chalk modeling of scenes similar to those chosen for painting.

Chemistry: (ALICE PELOUBET NORTON.) The study of the leaves and their constituents has introduced the pupil to the elements oxygen, hydrogen, nitrogen, and carbon. The properties of air and water have been investigated, as well as the phenomena of combustion. The students have become somewhat familiar with chemical methods and the processes of analysis and synthesis, and have learned some chemical nomenclature, and become acquainted with certain classes of compounds, as the oxides and carbonates.

The next step is the investigation of the mineral matter of the leaves. The ash is mixed with distilled water, thoroughly stirred, and then filtered and washed, and the filtrate evaporated and weighed. The flame test is then applied to discover the presence or absence of potassium and sodium. Some of the residue is again dissolved, and a few drops of silver nitrate added to the test for chlorine. To further study chlorine, it is prepared for the students from manganese dioxide and hydrochloric acid in the usual way. A jet of hydrogen burned in the chlorine, with the consequent formation of hydrochloric acid, may lead to the discussion of the meaning of the term "acid." The best opportunity for introducing this, with the supplementary ideas of "base" and "salt," will be carefully sought.

The following quantitative experiment for the determination of the chlorine in common salt will be used:

Pulverize about 5 grams of table salt, and dry it thoroughly by heating it in an evaporator for five minutes over the Bunsen burner flame. When cool weigh out exactly 1 gram of the salt. Put this in a beaker. Add about 30 c. c. of distilled water, and warm until the salt dissolves. Add 10 drops of nitric acid. Measure out 125 c. c. of silver nitrate solution, and, using a stirring rod to direct the stream, pour carefully, with constant stirring, the nitrate solution into the salt solution. Protect the contents of the beaker from the action of sunlight. Heat gently, with occasional stirring, until the precipitate has settled. Have ready in a funnel a well-dried and weighed filter paper. Decant the clear liquid down the rod into the filter. Transfer all the precipitate to the filter. In order to get out the last particle, use your rod and a stream of water from the wash bottle. Wash the precipitate well with distilled water until 3 c. c. of the filtrate gives no turpidity with one drop of hydrochloric acid. Dry the precipitate on the filter paper to constant weight, being careful not to burn the paper. Find the weight of the silver chloride formed. Calculate the percentage of chlorine in the sample of salt used.

This experiment will introduce the subject of the law of definite proportions. If the pupils are ready for it, the atomic theory in its simplest form will be taken up, with atomic and molecular weight.

The amount of chlorine as well as the proportion of chlorides in the ash will be calculated.

Mathematics: (George W. Myers.) The work for this month will be the same for these grades, and it will include the study by trigonometric methods of the same subject-matter as is given under the heading Geometry for the Ninth Grade. In addition to this, some work will be begun with the compass, transit, and other civil engineering instruments, by way of preparation for the field-work, which will be again taken up as soon as the weather will permit. During this month plain trigonometry will be completed, and numerous exercises will be given in the design of parts of structures, in the composition and resolution of forces, and in the triangulation of distances.

High School and Ensemble Songs: *The Happy Farmer, Peaceful Slumbering, Thy Mercies, Lord,* (canon for two voices); *We Merry Minstrels* (round, three parts), Modern Music Series, Third Book; *The Fir Tree, All Ye Nations, On the Wild Rose Tree, Ring Out, Wild Bells,* Songs of Life and Nature.